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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,660

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Yuichiro Shindo

OGOSH53USA

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HOWSON & HOWSON LLP
501 OFFICE CENTER DRIVE
SUITE 210
FORT WASHINGTON, PA 19034

EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1793

NOTIFICATION DATE

DELIVERY MODE

08/19/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

Office Action Summary	Application No. 10/595,660	Applicant(s) SHINDO, YUICHIRO	
	Examiner JESSEE ROE	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,9-11,14,15,18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,9-11,14,15,18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-2, 9-11, 14-15 and 18-19 are pending wherein claims 9, 14 and 18 are amended and claims 3-8, 12-13 and 16-17 are canceled.

Status of Previous Rejections

The previous rejection of claims 9-10, 14-15 and 18-19 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is withdrawn in view of the cancelation of the subject matter "wherein said high purity hafnium of said sputtering target has a residual resistance ratio of 120 to 200".

Examiner Note

The amended features of claims 9, 14 and 18 change the dependence of these claims from a dependent claim to an independent claim and therefore do not change the rationale of the applied rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 9-11, 14-15 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shindo (US 2003/0062261).

In regards to claims 1-2 and 11, Shindo ('261) discloses a high purity hafnium metal with minimal impurities (abstract). Shindo ('261) discloses (Example 2) forming a 4N (99.99%) purity level hafnium metal excluding gas components such as carbon, oxygen, and nitrogen [0133]. Oxygen and carbon would be present at levels less than 500 ppm and forming a sputtering target or thin film and zirconium would be present at levels of 0.5 weight percent or less ([0064] and claim 7).

The Examiner notes that the composition disclosed by Shindo ('261) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amount of gas components such as oxygen, carbon, and nitrogen from the amounts disclosed by Shindo ('261) because Shindo ('261) discloses the same utility throughout the disclosed ranges.

With respect to the recitation "a sulfur content of 10wtppm or less, a phosphorus content of 10wtppm or less, and a zirconium content of 0.1wt% or less" as in claims 1-2, the Examiner notes that purer forms of known products may be patentable, but the mere purity of a product alone does not render the product unobvious. MPEP 2144.04 (VII).

With respect to the amended transitional term "consisting" in claim 2, the Examiner notes that the products disclosed by Shindo ('261) does not require elements

in addition to hafnium. Therefore, Shindo ('261) meets the claim.

With respect to the recitation "wherein said oxygen content is 10wtppm or less" of claims 9, 14 and 18, Shindo ('261) discloses that oxygen would be reduced to 500 ppm or less [0064].

With respect to the recitation "wherein said sputtering target has a body produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot, subjecting the ingot to deoxidation with molten salt, and forming a sputtering target from the ingot after said deoxidation" of claim 10, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the recitation "wherein said thin film a sputtered thin film produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot, subjecting the ingot to deoxidation with molten salt, forming a sputtering target from the ingot after said deoxidation, and depositing said thin film on the substrate by performing sputtering with the sputtering target" of claim 15, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not

depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the recitation "wherein said high purity hafnium is produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot and subjecting the ingot to deoxidation with molten salt" as in claim 19, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Claims 1-2, 9-10 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the ASM Handbook Volume 2.

In regards to claims 1-2, the ASM Handbook Volume 2 discloses (pg. 1094, cols. 2-3) purifying metals such as hafnium to a purity approaching 99.999% by chemical vapor deposition when a low-iron starting material would be used. The ASM Handbook further discloses that if the proper temperature is maintained, oxygen, nitrogen, hydrogen, carbon, and other typical metal impurities would not be carried over.

The Examiner notes that the purity of the hafnium disclosed by the ASM Handbook Volume 2 overlaps the purity of the instant invention, which is prima

facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed hafnium purity from the hafnium purity disclosed by the ASM Handbook Volume 2 because the ASM Handbook Volume 2 discloses the same utility throughout the disclosed range.

With respect to the recitation “A sputtering target or thin film, comprising a sputtering target or thin film formed of high purity hafnium”, the Examiner notes that although the ASM Handbook Volume 2 does not specify the size of the hafnium metal, “a sputtering target or thin film” is not defined to exclude any specific size or shape of metal. Furthermore, changing the size/proportion of the hafnium metal would not patentably distinguish over the prior art. MPEP 2144.04 (IV).

With respect to the amended transitional term “consisting” in claim 2, the Examiner notes that the ASM Handbook Volume 2 does not require elements in addition to hafnium. Therefore, the ASM Handbook Volume 2 meets the claim.

With respect to the recitation “wherein said oxygen content is 10wtppm or less” of claims 9 and 18, the ASM Handbook Volume 2 discloses (pg. 1094, col. 2) discloses that oxygen would not be carried over. Therefore the recited residual resistance ratio would be expected. MPEP 2112.01 I.

With respect to the recitation “wherein said sputtering target has a body produced by subjecting a hafnium raw material to electron beam melting to form a

hafnium ingot, subjecting the ingot to deoxidation with molten salt, and forming a sputtering target from the ingot after said deoxidation" of claim 10, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the recitation "wherein said high purity hafnium is produced by subjecting a hafnium raw material to electron beam melting to form a hafnium ingot and subjecting the ingot to deoxidation with molten salt" as in claim 19, the Examiner notes that the claims are drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Response to Arguments

Applicant's arguments filed 10 August 2010 have been fully considered but they are not persuasive.

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First, the Applicant primarily argues that Shindo ('261) discloses a hafnium material in Example 2 with an impurity analysis before refinement shown in Table 3 and an impurity analysis after refinement shown in Table 4; the amount of zirconium (as an impurity) in a hafnium material is 3500 ppm (0.35%), which is the level of impurity taught to one of ordinary skill in the art by the prior art Shindo ('261) publication; and the prior art teaching of 3500 ppm is far greater than that required by the claims of the present application (i.e., a zirconium content of 0.1 weight percent or less).

In response, the Examiner notes that Shindo ('261) teaches that the zirconium content may be reduced to 0.5% or less [0065] and although an example in this reference may teach reducing to 0.35%, this would not be the minimum amount of zirconium present in a hafnium material. Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments. MPEP 2123 II.

Second, the Applicant primarily argues that Shindo ('261) discloses reducing the oxygen content from 500 ppm to 120 ppm based on "electron beam melting" refining techniques and this clearly does not reach the level of 40 ppm or less or 10 ppm as claimed in the present application and electron beam melting cannot be used to reach this level. The Applicant further argues that the present invention reduces oxygen by performing "molten salt electrolysis" and only thereby achieves an oxygen content of 40 ppm or less.

In response, the Examiner notes that Shindo ('261) teaches that the combined oxygen and carbon content can be reduced to 500 ppm or less [0064]. The Examiner further notes that the claims are drawn to a product and not a process.

Third, the Applicant primarily argues that there is no prior art reference of record in the present application that discloses a deoxidation method based on molten salt for hafnium.

In response, the Examiner notes that while the processing disclosed in the instant application may be distinct from the applied references, the product does not distinguish from the applied references.

Fourth, the Applicant primarily argues that the ASM Handbook provides the description "If a starting material with low iron content is used, its condensed vapor should reach a purity of 99.999%". However, one of ordinary skill in the art would be well aware that there is no scientific basis on which the same results would be expected for all metals. The Applicant further argues that the ASM Handbook fails to acknowledge the problems concerning removal of phosphorus and sulfur and it would be erroneous to conclude that the present invention could have been easily conceived by one of ordinary skill in the art at the time of the invention on the disclosure provided by the ASM Handbook.

In response, the Examiner notes that the disclosure in the ASM Handbook to achieve a purity of 99.999% would not necessarily apply to all metals, but rather the disclosed metals which are hafnium, thorium, vanadium, niobium, tantalum and molybdenum wherein the starting metal has a low iron content (pg. 1094, right column).

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The Examiner further notes that the ASM Handbook indicates that iron would be the most troublesome to remove (hence the desirability a low-iron starting material) and does not indicate any problems removing phosphorus and sulfur.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Roy King/
Supervisory Patent Examiner, Art
Unit 1793

/JR/